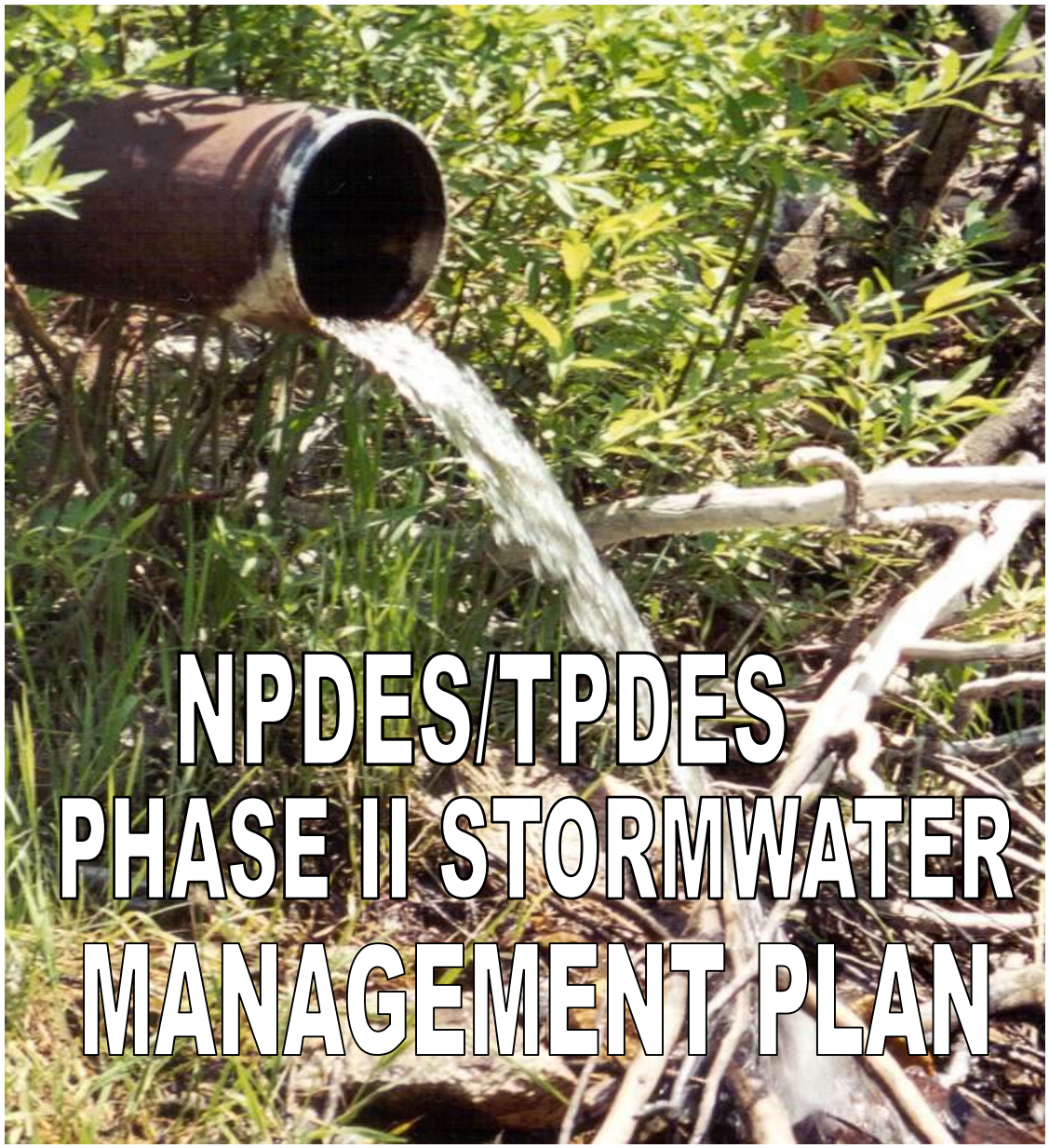
CITY OF SUGAR LAND



# NPDES/TPDES PHASE II STORMWATER MANAGEMENT PLAN

**MAY 2004**

## EXECUTIVE SUMMARY

The State of Texas assumed the authority to administer the National Pollutant Discharge Elimination System (NPDES) program in Texas in 1998. NPDES is a federal regulatory program to control discharges of pollutants to surface waters of the United States. The Texas Commission on Environmental Quality's (TCEQ) Texas Pollutant Discharge Elimination System (TPDES) program now has federal regulatory authority over most discharges of pollutants to Texas surface water.

The national stormwater regulations originally applied only to cities with populations larger than 100,000. The NPDES Phase II rule, promulgated in December 1999, expanded the scope of the NPDES program to include smaller local governments. Sugar Land and other small municipalities with populations under 100,000 that manage their stormwater facilities are now regulated as Phase II municipalities under the NPDES/TPDES municipal separate storm sewer system (MS4) permit requirements. The TCEQ is expected to issue a General Permit for stormwater discharges from Phase II cities in Texas in late 2004. Phase II cities will be required to obtain permit coverage within 90 days of the permit issuance date. According to the draft permit, the City will be given five years to fully implement a Stormwater Management Program (SWMP) once the final permit is issued. The City will be required to submit annual reports to TCEQ during this time.

The City of Sugar Land, as an operator of a small MS4, will be required to reduce the discharge of pollutants to water of the State and the United States to the "maximum extent practicable" to protect water quality. At a minimum, the permit will require a SWMP that addresses the following issues:

- Specify Best Management Practices (BMPs) for six minimum control measures (MCMs) and implement them to the "maximum extent practicable"
- Identify measurable goals for these control measures
- Develop an implementation schedule for these control measures or frequency of activities and
- Define the responsible entity to implement these control measures.

The final rule requires the permittee to choose *appropriate* BMPs for each of six MCMs. In other words, the EPA expects Phase II permittees to tailor their stormwater management plans and their BMPs to fit the particular characteristics and needs of the permittee and the area served by its MS4. Therefore, the Federal or State operator of a regulated storm sewer system can take advantage of the flexibility provided by the rule to utilize the most suitable MCMs for its MS4.

To qualify for permit coverage, the MS4 must develop a SWMP that describes the BMPs they will develop and implement to minimize the discharge of pollutants from the MS4 to the maximum extent practicable. The six MCMs as defined by the EPA are as follows:

- *Public Education and Outreach* - The MS4 is required to develop and implement a Public Education Program, or equivalent outreach activities, to distribute information to the community about impacts of stormwater discharges on water bodies and steps the public can take to reduce pollutants in stormwater runoff.
- *Public Involvement and Participation* - The MS4 is required to, at a minimum, comply with State/Local notice requirements and is recommended to include public in developing/implementing/reviewing the SWMP and engage all economic and ethnic groups.
- *Illicit Discharge Detection and Elimination* – The MS4 must develop, implement, and enforce a program to detect and eliminate illicit discharges. As part of this program, the MS4 must develop a storm sewer system map with locations of all outfalls, establish an ordinance (or other regulatory mechanism) prohibiting illicit discharges, establish enforcement procedures and actions, detect and address illicit discharges (including illegal dumping), and inform employees, businesses and general public of the program.
- *Control of Construction Site Runoff* – The MS4 is required to develop, implement, and enforce a program to reduce pollutants in runoff from construction activities disturbing greater than or equal to one acre (including smaller sites that are part of a greater common plan of development), with an ordinance (or other regulatory mechanism), sanctions, and procedures. The MS4 must also require construction site operators to implement erosion and sediment control BMPs and to control waste.
- *Post-construction Stormwater Management* – The MS4 is required to develop, implement, and enforce a program for stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre (including smaller sites that are part of a greater common plan of development), with an ordinance (or other regulatory mechanism) to address post-construction runoff, structural and non-structural BMPs appropriate to the community, and ensure adequate long-term operation and maintenance.
- *Pollution Prevention and Good Housekeeping* – The MS4 is required to develop and implement an operation and maintenance program that has the goal of preventing/reducing pollutant runoff from municipal operations and has an employee training component.

The City of Sugar Land is uniquely positioned to implement a stormwater program due to existing personnel and resources available in various City departments. Existing City departments currently performing functions generally associated with the implementation of a stormwater program include Public Works, Development Services, Parks & Recreation, Finance & Administration, Municipal Courts, City Manager's Office, and Communications. The existing City departments have the ability to perform most of the elements comprising a comprehensive stormwater program with minimal additional personnel costs.

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# SECTION 1 - OVERVIEW

## 1.1 CITY BACKGROUND

### *1.1.1 City Organization*

Sugar Land is a full-service municipality providing the highest quality of affordable services to meet the needs of its citizens. Sugar Land is an economically strong and culturally diverse community of approximately 70,000 residents. Sugar Land ranks number one in growth among municipalities in the Houston metro area and number one in growth among the state's 45 largest cities. The City was incorporated in 1959 and adopted a home rule form of government.

A home rule charter may provide for establishment of type of government, specify the number of members, allow annexation, set property tax rates, and may authorize any other function, responsibility, or provision provided they are not specifically prohibited by the state constitution or laws. This gives municipalities like Sugar Land broad powers of enforcement and the ability to establish ordinances to regulate the various stormwater program elements.

The home rule charter, as amended, provides for a council-manager government, which includes a mayor and six council members who are elected for a term of two years, with a term limit of four consecutive terms. Under this system, Council appoints the City Manager, who acts as chief executive officer of the government. The Mayor and two council members are elected at-large in even years, and the remaining four council members are elected by single member district in odd years. The Mayor and City Council establish goals and priorities each fiscal year, while the City Manager implements those objectives established by the governing body. The City Manager carries out policy and administers City programs. All department heads are ultimately responsible to the City Manager.

### *1.1.2 Key Personnel*

The City is uniquely positioned to implement a stormwater program due to existing personnel and resources available in the various City departments. Existing City departments currently performing functions generally associated with the implementation of a stormwater program include Public Works, Development Services, Parks & Recreation, Finance & Administration, Municipal Courts, City Manager's Office and Communications.

In addition, the City of Sugar Land partners with the non-profit organization Keep Sugar Land Beautiful (KSLB) to carry out some of its environmental public outreach and education programs. Through its affiliation with Keep Texas Beautiful and Keep America Beautiful, KSLB's programs help motivate volunteers to improve their neighborhoods and create a healthier, safer, and more livable environment. KSLB will be

available to assist the City with public education and outreach pertaining to the Stormwater Management Plan.

The existing City departments have the ability to perform most of the elements comprising a comprehensive stormwater program with minimal additional personnel costs.

The City will evaluate the need to create a Stormwater Management Team so that City employees in participating departments can remain actively involved in developing and implementing the program. This team would be established in Permit Year 1 and would meet monthly or quarterly, as needed, throughout the permit term. The Stormwater Management Program (SWMP) Coordinator in the Public Works Department would facilitate these meetings and coordinate SWMP activities.

### *1.1.3 City Drainage Operations*

The City of Sugar Land recognizes the importance of consistent, uniform and integrated management of stormwater operations, design standards, and capital improvements within its jurisdiction.

The Street/Drainage Division within the Public Works Department is responsible for the administration and operation of the City's public streets, sidewalks, bridges, and drainage system.

The Street/Drainage Division infrastructure responsibilities include:

- 802 lane miles of streets
- 296 acres of rights-of-way and drainage easements mowed
- 344 miles of sidewalks
- 216 miles of storm sewer/open ditches
- 5,450 storm inlets
- 796 lane miles of concrete and asphalt streets
- 31 bridges

The Street/Drainage Division is responsible for contract development, administration, and inspection of street sweeping services provided to arterial streets, major collector streets and TxDOT intersections of City streets. The primary objective of the street-sweeping program is to provide routine sweeping and cleaning of high traffic areas throughout the City where accumulations of debris occur.

The Division is also responsible for the mowing of approximately 296 acres of public rights-of-way (ROW) and drainage easements throughout the City. Rough cut mowing is done 15 times throughout the year, and groom cut mowing is done on an as-needed basis.

The Street/Drainage Division is responsible for the inspection and maintenance of 216 miles of storm sewer lines and open ditches. This division is also responsible for inspecting and cleaning 5,450 storm inlets during and after rain events. In addition, the division is responsible for maintaining a positive flow for all open ditches. Periodic re-grading is required when the ditches become overly silted and stagnant.

### *1.1.4 MS4 Jurisdictional Overlap*

The City of Sugar Land's drainage operations has jurisdictional overlap with several levee improvement districts (LIDs) and Fort Bend County.

There are several LIDs that are partially or fully located within the corporate City limits of Sugar Land. These LIDs have the similar authority and responsibility over drainage operations within their boundaries as the City. These LIDs are considered MS4s and are subject to the NPDES stormwater requirements. The City will coordinate with the LIDs and work through the political ramifications of these overlays to minimize duplication of effort in Phase II compliance.

Stormwater and drainage activities in Fort Bend County are implemented through the Fort Bend County Drainage District (Drainage District). Funding for all Drainage District activities are approved by the Drainage District Board (Commissioners Court). The primary mission of the Drainage District is to maintain the drainage channels, where the Drainage District has easements, in their existing flow conditions. The Drainage District accomplishes this through appropriate structural repairs and vegetation control. Secondarily, the Drainage District provides a review of plats and drainage plans of new development to be approved by Commissioners Court to assure the elimination of an adverse drainage impact on current and future residents.

The Drainage District's primary activities are associated with flood control in Fort Bend County. The Drainage District does not own or maintain storm sewer systems or drainage facilities other than channels. The Drainage District is well equipped to maintain large drainage channels and does so today for approximately 1,100 miles. However, they are currently not well positioned to be the primary entity for implementing a comprehensive stormwater program including all the Minimum Control Measures (MCMs).

While Fort Bend County is considered an MS4, subject to the NPDES stormwater requirements, and plays an important role in the overall development of a stormwater program for Sugar Land, their organizational structure and overall mission is not considered to be an efficient model for developing a comprehensive stormwater program. The Drainage District should be included in any discussions concerning a program in Sugar Land and potentially could provide some service to the program, especially related to maintenance, if needed in the future.

## 1.2 STORMWATER MANAGEMENT

### *1.2.1 Introduction to Stormwater Management*

Stormwater management is an essential component of community infrastructure and serves to provide both increased convenience and protection of lives and property. A properly designed system will detain and/or carry away runoff from rainfall events while allowing the movement of vehicles to homes and businesses. The City's storm sewer system was designed to capture and transport rain water runoff into local creeks and rivers to prevent street and neighborhood flooding.

Active management of stormwater by local jurisdictions can protect public health and create a more attractive community. Drainage systems influence the water quality of the natural waterways that receive the area's rainfall runoff. Creeks, rivers, and bays provide wildlife habitat and support commercial and recreational fisheries, boating and nature tourism. They are fundamental to the quality of life in this region.

Stormwater runoff can cause water pollution by carrying pollutants into the water supply. According to a report on water quality by the EPA, approximately 40 percent of the rivers, lakes, and estuaries that have been assessed by environmental protection agencies are not meeting water quality standards. The report found that urban runoff and discharges from storm sewers are major sources of water quality problems.

Providing Sugar Land with a stormwater management system that allows sustainable community growth is a continuing challenge. It involves educating residents, setting minimum standards, planning for future detention basins and drainage channels, working with private development interests, coordinating with governmental agencies, and maintaining the efficiency of the existing system of culverts, pipes, and other structures.

Recognizing that stormwater system development should be guided by adopted policies and a comprehensive plan, the City of Sugar Land has developed this Five-Year Stormwater Management Plan to address the issue.

### *1.2.2 Benefits of Stormwater Management*

By more effectively managing stormwater runoff, local governments can protect public health, spur economic development, and create a more attractive community. Contamination of community drinking water threatens public health and causes significant cleanup expense. Preventing contamination of drinking water avoids the costs of additional treatment facilities, locating new drinking water sources, and restoring citizens' confidence in their drinking water, public utilities, and community leaders.

Many techniques that local governments use to address stormwater can also double for recreational purposes. Natural vegetation buffers preserved along rivers and other bodies of water can provide ideal locations for hiking trails. Stormwater detention ponds can double as bird-watching hot spots. Open spaces preserved for drainage can be used for soccer fields, golf courses, and picnic spots.

## 1.3 STORMWATER REGULATION

### *1.3.1 History of Stormwater Regulation*

The Environmental Protection Agency (EPA), under the Clean Water Act (CWA), regulates stormwater discharges by issuance of National Pollutant Discharge Elimination System (NPDES) permits. The 1972 amendment to the CWA prohibits discharge of any pollutant into the waters of the United States from a point source unless the discharge is authorized by a NPDES permit. The NPDES program initially targeted easily detected sources of water pollution such as municipal sewage and industrial process wastewater and was successful in improving water quality. However, the NPDES program was not addressing other significant sources of water quality impairment – nonpoint sources such as runoff from agricultural and forestry operations, and stormwater runoff.

Congress further amended the CWA in 1987 and required the EPA to establish NPDES requirements for stormwater discharges. A comprehensive, two-phase approach to stormwater control was established. On November 15, 1990, the EPA published (55 Federal Register 47990) initial permit application for 11 categories of stormwater discharges associated with industrial activity and from drainage systems located in municipalities with a population of 100,000 or more. The Phase I stormwater regulations required large sources of stormwater discharge to apply for NPDES permits. Large sources include medium and large municipal storm sewer systems usually serving 100,000 people or more, as well as several categories of industrial activity including construction activity disturbing five or more acres of land.

In 1998, the Texas Commission for Environmental Quality (TCEQ) was delegated authority to administer the NPDES permitting program in Texas. The Texas Pollutant Discharge Elimination System (TPDES) program now has federal regulatory authority over discharges of pollutants to Texas surface waters.

The NPDES Phase II rule, promulgated in December 1999, expanded the scope of the NPDES program to include smaller local governments. Sugar Land and other small municipalities (population under 100,000) that manage their stormwater facilities are regulated as Phase II municipalities under the NPDES/TPDES municipal separate storm sewer system (MS4) permit requirements. The TCEQ is expected to issue a General Permit for stormwater discharges from Phase II cities in Texas in late 2004. Phase II cities will be required to obtain permit coverage within 90 days of the permit issuance date. The permit term will cover five years.

Under the Phase II stormwater regulations, a SWMP must be developed for Sugar Land, to the extent allowable under state and local law, and implemented according to the requirements of Part III of General Permit TXR040000 for stormwater discharges that reach Waters of the United States. The SWMP should be developed to prevent pollution in stormwater to the maximum extent practicable and effectively prohibit illicit discharges to the system.

The final rule requires the permittee to choose *appropriate* best management practices (BMPs) for each of six MCMs. In other words, the EPA expects Phase II permittees to tailor their stormwater management plans and their BMPs to fit the particular characteristics and needs of the permittee and the area served by its MS4. Therefore, the operator of a regulated storm sewer system can take advantage of the flexibility provided by the rule to utilize the most suitable MCMs for its MS4.

To qualify for permit coverage, the MS4 must develop a SWMP that describes the BMPs they will develop and implement to minimize the discharge of pollutants from the MS4 to the maximum extent practicable. The SWMP must address BMPs in the following subject areas or MCMs:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Control of Construction Site Runoff
- Post-construction Stormwater Management
- Pollution Prevention and Good Housekeeping

Sugar Land qualifies as a Phase II MS4 and must obtain permit coverage. This report describes recommended BMPs that will be incorporated into the SWMP and implemented by the City of Sugar Land.

### *1.3.2 NPDES Phase II Minimum Control Measures*

To qualify for permit coverage, Sugar Land must develop a SWMP that addresses six MCMs. These subject areas are:

1) *Public Education and Outreach* – The MS4 is required to develop and implement a Public Education Program, or equivalent outreach activities, to distribute information to the community about effects of stormwater discharges on water bodies and steps the public can take to reduce pollutants in stormwater runoff.
2) *Public Involvement and Participation* – The MS4 is required to, at a minimum, comply with State/Local notice requirements and is recommended to include the public in developing, implementing, and reviewing the SWMP and engage all economic and ethnic groups.
3) *Illicit Discharge Detection and Elimination* – The MS4 must develop, implement, and enforce a program to detect and eliminate illicit discharges including:
    - Storm sewer system map with location of all outfalls
    - Ordinance (or other regulatory mechanism) prohibiting illicit discharges
    - Enforcement procedures/actions
    - Detect and address illicit discharges (including illegal dumping)
    - Inform employees, businesses and general public

4) *Control of Construction Site Runoff* – The MS4 is required to develop, implement and enforce a program to reduce pollutants in runoff from construction activities disturbing greater than or equal to one acre (including smaller sites that are part of a greater common plan of development), with:
    - Ordinance (or other regulatory mechanism), sanctions
    - Procedures
    - Require construction site operators to implement erosion and sediment control BMPs and to control waste
5) *Post-Construction Stormwater Management* – The MS4 is required to develop, implement and enforce a program for stormwater runoff from New/Redevelopment projects that disturb greater than or equal to one acre (including smaller sites that are part of a greater common plan of development), with:
    - Ordinance (or other regulatory mechanism) to address post-construction runoff
    - Structural and non-structural BMPs appropriate to the community
    - Ensure adequate long-term operation and maintenance
6) *Pollution Prevention and Good Housekeeping* – The MS4 is required to develop and implement an operation and maintenance program with the goal of preventing/reducing pollutant runoff from municipal operations. The program must have an employee training component.

For the SWMP, Sugar Land must identify BMPs that will be implemented over the five-year permit term, implementation schedule, responsible persons, and measurable goals by which the permittee will self-report progress in an Annual Report to the TCEQ. Existing programs or BMPs may also be used to fulfill the requirements of the general permit.

### *1.3.3 Capacity and Authority of MS4s to Implement and Enforce MCMs and BMPs*

According to the EPA regulations at 40 CFR 122.34 (a), the MS4 permit will require, at a minimum, that the MS4 develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. The MCMs that have specific enforcement requirements are:

- *Illicit Discharge Detection and Elimination* – The illicit discharge MCM requires the MS4 to develop, implement, and enforce a program to detect and eliminate illicit discharges into the MS4. The MS4 must prohibit non-stormwater discharges into the storm sewer system and implement appropriate enforcement procedures and actions and develop and implement a plan to detect and address non-stormwater discharges, including illegal dumping, into the storm sewer system.
- *Construction Site Stormwater Runoff Controls* – The construction site runoff MCM requires the MS4 to develop, implement, and enforce a program to reduce

pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre (or less than an acre if it is part of a larger common plan of development). The MS4 must have a regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance. Examples of sanctions to ensure compliance include non-monetary penalties, fines, bonding requirements, and/or permit denials for noncompliance.

- *Post-Construction Stormwater Management in New Development and Redevelopment* – The post-construction MCM requires the MS4 to develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre (including projects less than one acre that are part of a larger common plan of development). The program must ensure that controls are in place that would prevent or minimize water quality impacts. The strategy must include a combination of structural and nonstructural controls.

While an MS4 only has to develop an enforcement program to the extent allowable by state or local law, they must have a program that will reduce the discharge of pollutants from the MS4 to the maximum extent practicable, protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act. This will require effective enforcement mechanisms.

## SECTION 2 - PUBLIC EDUCATION AND OUTREACH

*40 CFR 122.34 (b)(1) – Implement a public education program to distribute educational materials to the community of contact, equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff.*

### 2.0 OVERVIEW

Public education and outreach is key to the success of a SWMP. Through public education, residents gain an understanding of how their actions affect stormwater quality and become more informed about stormwater quality issues in their community. When citizens understand that poor water quality can result from common everyday activities, a major source of pollutants in stormwater can be voluntarily eliminated. Perhaps more important, an educated public can be a broad base of support for a SWMP. The objectives of a public education program should be to promote a clear identification and understanding of the problem and solutions and to promote community ownership of the problems and solutions.

The City is dedicated to educating the Sugar Land community on how to prevent stormwater pollution. In this regard, the City will provide educational information to the Sugar Land community, and in collaboration with organizations like KSLB, community volunteers will assist in stormwater pollution prevention education.

The City of Sugar Land's public education program will address the following target audiences:

- Adult residents
- Students
- Municipal employees
- Businesses, including commercial and industrial facilities
- Construction site operators

Numerous stormwater public education materials have already been developed by the EPA, state, and local agencies and are available for distribution or reprinting. In addition, the City will coordinate public education efforts with Fort Bend County, LIDs, and municipal utility districts (MUDs) where feasible.

**Table 2.1 BMP and measurable goal summary for Public Education and Outreach.**

| BMP | MEASURABLE GOAL | PERMIT YEAR | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Cast grates and manholes | Add revision to detailed notes | X | | | | |
| Business education/recognition program | Develop & implement program | | | X | | |
| Mobile business education program | Develop & implement program | | | X | | |
| Stormwater quality educational materials | Develop & distribute | X | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Municipal website and cable channel | Develop & disseminate info | X | | | | |
| Student education | Meet with other MS4s | X | | | | |
| | Distribution of book covers & book cover contest | X | | | | |
| | Implement school curriculum | | | | X | |
| Wetlands education | Coordinate wetlands tours | X | | | | |
| | Wetlands education center | | | | X | |

## 2.1 CAST GRATES AND MANHOLES

**Description**

Custom-design storm drain cast grates and manholes heighten public awareness about how most drainage systems are directly connected to receiving waters with little or no treatment. Detailed notes on design standards will refer to custom-made cast grates and manholes for new development and redevelopment of infrastructure within the corporate city limits. Existing cast grates and manholes will not be retrofitted unless their replacement is warranted. New developments outside the corporate city limits but within the City's extraterritorial jurisdiction would be contractually required to install cast grates and manholes through development agreements. The grates and manholes would contain the message "Dump No Waste, Drains to Waterways".

**Measurable Goals**

- Evaluate and modify design standards for cast grates and manholes.
- Add the requirements to detailed notes for new development and redevelopment.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**

- Develop requirement criteria and adopt standards in Permit Year 1.

## 2.2 BUSINESS EDUCATION/RECOGNITION PROGRAM

**Description**

Sugar Land will establish an incentive program for businesses, which may include recognition plaques, stickers, and/or newsletter recognition. This program may involve development of a set of guidelines for area businesses or on-site evaluation with recommendations by City employees of practices that will assist the business in minimizing pollution.

As part of the Business Recognition Program, specific guidelines may be developed for certain types of businesses. The City may target certain types of businesses with higher

pollution potential by developing a Clean Water Business Partner Program with businesses such as dry cleaners that have a higher pollution potential.

A Pollution Prevention Guide for Businesses that was developed by Galveston Bay Estuary Program can be distributed as part of this program. In addition, TCEQ has a Small Business and Environmental Assistance Program that conducts Pollution Prevention Audits (non-enforcement program). The business education program can use the existing TCEQ pollution prevention auditing capability to assist with the program. The program can be done by nomination or application, with inspections of proposed participants, and could recognize participation in TCEQ pollution prevention audits. Environmentally aware businesses might be more willing to partner with municipalities and sponsor programs. Program costs will vary depending on how the program is implemented. If the program is implemented by nomination or applications, costs are expected to be lower. By using the TCEQ audits and existing resources within the Public Works department, labor needs for this program will be minimal.

**Measurable Goals**

- A specified number of businesses per year meet criteria for recognition. This number will be determined during the program development, which will occur in Permit Year 3.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Plaques/certificates
    - Stickers
    - Guidance brochures or booklets

**Implementation Schedule**
Develop the Business Education/Recognition Program by Year 3. Begin implementing the program in Permit Year 3.

## 2.3 MOBILE BUSINESS EDUCATION PROGRAM

**Description**
In conjunction with the Business Education/Recognition Program, Sugar Land will develop and implement a multi-language mobile business education program. This program would focus on traditionally mobile businesses that are often more difficult to monitor because they undertake activities at a number of locations. Mobile businesses include lawn maintenance, carpet cleaning, painting and decorating, pest control, and gardening.

Initially, Sugar Land's mobile business education program would be targeted primarily toward lawn maintenance companies, since many homeowners in the community pay a

contractor for this service. Eventually, the program can be expanded to include other types of mobile businesses.

The primary objectives of this program would be to educate businesses on ways they can change or improve their work practices to:

- Reduce or avoid stormwater pollution
- Reduce the generation of waste
- Increase resource recovery through recycling, reuse and composting
- Achieve environmental best practices through cleaner production techniques
- Achieve cost savings in terms of reduced materials and water usage
- Improve their environmental image with the local community.

Businesses engaged in landscaping activities should be educated in proper use of landscaping chemicals and in proper green waste disposal. In addition, workers should be trained to pick up any litter before mowing so that the trash doesn't get shredded and washed into the storm drain. The goal of this educational outreach program is to reduce chemical and green waste runoff to natural watercourses. This is accomplished by minimizing the use of herbicides, fertilizers, and insecticides to no more than the recommended levels and by properly disposing of green waste resulting from mowing, tree trimming, weed eating, and edging.

**Measurable Goals**

- Develop or acquire multi-language training materials on the proper use of landscaping chemicals and the proper disposal of yard waste.
- Implement educational outreach program for lawn maintenance companies that conduct business in Sugar Land.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Multi-language training materials
    - Translation costs

**Implementation Schedule**
Develop or acquire training materials by Permit Year 3. Implement educational outreach program in Permit Year 3.

## 2.4 STORMWATER QUALITY EDUCATIONAL MATERIALS

**Description**
The City is required to inform residents about the effects polluted stormwater runoff can have on water quality, hazards associated with illegal discharges and improper disposal

of waste, and how they can minimize their effects on stormwater quality. The City must ensure and document that a reasonable attempt was made to reach all constituents within the area.

Sugar Land will develop and distribute printed materials on lawn and garden management, proper handling of household hazardous waste, pet waste, littering, commercial stormwater impacts, waste management, and other stormwater quality related issues. In addition, the City will distribute educational promotional items at community events.

**Measurable Goals**

- Distribute printed materials and promotional items at community events in which the Public Works department is a participant.
- Distribute printed materials to hotels, real estate agencies, and other similar types of businesses that may have contact with visitors to the area.
- Include information on specific stormwater quality issues in the city newsletter, which will be mailed to residents six times per year beginning in FY 2005.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Printed materials
    - Promotional giveaways

**Implementation Schedule**
Initial print materials will be developed in Permit Year 1, with ongoing development and distribution throughout the permit term.

## 2.5 MUNICIPAL WEBSITE & MUNICIPAL CABLE CHANNEL

**Description**
Sugar Land will use the municipal website and municipal cable channel to inform the public about the SWMP. The City website presently contains information about non-point source (NPS) pollution and the impact that NPS pollution has on water quality. However, this information is embedded in the Public Works Department, Street/Drainage Division web pages. As part of the SWMP, the City will make the stormwater information more prominent on the website and fewer clicks away from the main page. The web page will include general stormwater quality information, as well as topics of interest to the general public such as litter control and proper management of pesticides, fertilizer, used oil, and household hazardous waste. The municipal channel, which should be in operation by FY 2005, will be used to disseminate messages regarding stormwater pollution prevention.

**Measurable Goals**

- Placement of stormwater information on website.
- Placement of stormwater information on municipal channel.
- Quarterly update of information.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**
Develop and place information on the City website and municipal channel in Permit Year 1. Update information on a quarterly basis.

## 2.6 STUDENT EDUCATION

**Description**
Sugar Land will seek opportunities to partner with local schools in presenting curriculum on water conservation and water quality. The City will work with Keep Sugar Land Beautiful (KSLB), other municipalities, municipal utility districts (MUDs) in the County, and Fort Bend Independent School District to evaluate the opportunity to create a district-wide education program to meet all county MS4 needs. The City will continue to sponsor an annual water quality and conservation book cover contest through Fort Bend Independent School District and to provide 15,000 book covers of the winners' artwork to area schools. The City will also continue to provide an additional 25,000 book covers on specific stormwater related issues to area schools.

**Measurable Goals**

- Hold at least one meeting per year with other MS4s in Fort Bend County.
- Hold water quality and conservation book cover contest annually and provide 15,000 book covers of winning artwork to area schools.
- Provide 25,000 book covers on stormwater related issues to area schools.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Curriculum guides
    - Book covers
    - Teacher training
    - Supporting teaching resources

**Implementation Schedule**
Continue to hold book cover contest and distribute book covers to area schools. Evaluate opportunity to collaborate with other entities on school curriculum in Permit Years 1-4, with a target implementation of Permit Year 4, if such a program is feasible.

## 2.7 WETLANDS EDUCATION

**Description**
There are wetlands areas within the corporate city limits that provide a valuable learning opportunity for school age and/or adult groups. Currently, KSLB volunteers give tours of wetlands sites upon request. These tours could be made available as part of the stormwater education curriculum for adults and school-age children. One of the wetlands areas is on property currently owned by Imperial Sugar. The City will work to encourage Imperial Sugar to continue operations of the wetlands until the City is able to successfully negotiate purchase of the property. In addition, the City will evaluate the budgetary feasibility of establishing a permanent wetlands education center that would promote stormwater quality education.

**Measurable Goals**

- The City, with volunteer support, will provide wetlands educational tours in each permit year as long as the facilities are available. The number of tours will vary depending on the number of requests the City receives and the availability of volunteer resources.

**Costs**

- Labor – TBD
- Equipment/Supplies – TBD

**Implementation Schedule**
Community volunteers will provide wetlands tours each permit year, beginning in Permit Year 1 (provided that facilities are available for public use). In Permit Year 4, the City will evaluate the feasibility of developing a permanent Wetlands Education Center.

## SECTION 3 – PUBLIC INVOLVEMENT AND PARTICIPATION

*40 CFR 122.34 (b)(2) – At a minimum, comply with state, tribal, and local public notice requirements when implementing a public involvement/participation program. EPA recommends that the public be included in developing, implementing, and reviewing your stormwater management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups.*

### 3.0 OVERVIEW

Public involvement/participation is important for the development of the SWMP. Involving the public goes hand in hand with a local government's public education efforts and can help accomplish some of the same goals. By encouraging input from diverse economic and cultural groups, there can be beneficial effects on the development of the program. One such benefit is that early and frequent public input can lead to a shorter implementation schedule and greater support for the program. Public involvement and participation can also create more opportunities to gain expertise from interested individuals and other organizations or governmental entities. These added resources could improve the success of the program.

**Table 3.1 BMP and measurable goal summary for Public Involvement and Participation.**

| BMP | MEASURABLE GOAL | PERMIT YEAR | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Public notice requirements | Comply with public notice requirements | X | | | | |
| Presentations on stormwater management plan | Schedule presentations as needed | X | | | | |
| | Inform civic organizations of staff availability | X | | | | |
| Community programs | | | | | | |
| -Adopt-a-Spot Program | Expand existing program | | | X | | |
| -Composting classes | Continue existing program | X | | | | |
| -Utilize volunteers to monitor water quality | Develop and implement program | | | X | | |

### 3.1 PUBLIC NOTICE REQUIREMENTS

**Description**

When implementing a public involvement/participation program, the City must comply with state, tribal, and local public notice requirements. The general permit itself will be subject to public notice and comment. Sugar Land will also want to provide the typical citizen public notice that similar local programs would require. This may include newspaper or similar publication of intent to be covered under the permit or of availability of the SWMP for review by the public at City Hall, public libraries and/or the municipal website. In addition, public input sessions may be held to acquire community feedback.

**Measurable Goals**

- Publication in the local newspaper prior to council adoption of pre-final and final SWMP
- Availability of pre-final and final SWMP for public review
- Public input sessions prior to council adoption of pre-final and final SWMP

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Copies of SWMP for public review

**Implementation Schedule**
Public input will be requested during development of the SWMP and intermittently throughout the permit term, if deemed necessary.

## 3.2 PRESENTATIONS ON STORMWATER MANAGEMENT PLAN

**Description**
Familiarizing City Council, municipal staff, the regulated community, and the public on the requirements of the program will facilitate implementation of the SWMP. Public presentations will be available upon request to the following groups throughout development and implementation of the SWMP:

- City council
- Municipal staff
- Homeowners associations
- Business associations
- Commercial property owners
- Local service clubs
- Other civic groups

Residents attending these meetings would be invited to give feedback on the SWMP after the presentations. In addition, the City would consider providing streaming video on some of the stormwater presentations in order to make information available to interested residents.

**Measurable Goals**

- Schedule presentations and informational meetings on an as-needed basis.
- Develop a list of civic organizations that may benefit from a presentation on the SWMP and inform them of staff availability.

**Costs**

- Labor – Existing City staff, but additional funds may be needed for overtime pay
- Equipment/Supplies – N/A

**Implementation Schedule**
Presentations beginning in Permit Year 1 and ongoing throughout the SWMP development and implementation process.

## 3.3 COMMUNITY PROGRAMS

Through the following three community programs, Adopt-a-Spot, Composting Classes, and Water Quality Monitoring, residents will develop first-hand knowledge of water quality issues in the Sugar Land community. The City will continue to evaluate opportunities to involve the public through other types of community programs such as grant-funded projects, Eagle Scout projects, grate mate programs, and storm drain markers.

### *3.3.1 Adopt-A-Spot Program*

**Description**
Sugar Land has an existing Adopt-A-Spot program. The purpose of the program is to provide groups within the City of Sugar Land with the opportunity to support and show pride in the community by volunteering to adopt a public area for the purpose of litter reduction and beautification. As part of the SWMP implementation, Sugar Land will extend this program to apply to waterways, ditches, and other stormwater channels.

**Measurable Goals**

- Expand program to cover additional locations, specifically waterways, ditches, right of ways, and other stormwater channels.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Additional Adopt-a-Spot signs

**Implementation Schedule**
The Adopt-A-Spot program will be expanded in Permit Year 3, and the program will be ongoing through the remaining permit years.

### *3.3.2 Composting Classes*

**Description**
Sugar Land provides regular composting classes to residents at no cost. The classes are held at the City's Yardwise Demonstration Site. The City will continue to hold composting classes in the spring and fall, with a goal of at least 75 participants each year.

**Measurable Goals**

- Hold spring and fall composting classes.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**
Ongoing.

### *3.3.3 Utilize Volunteers to Monitor Water Quality*

**Description**
The purpose of this program is to assist in efforts to give citizens first-hand knowledge of the quality of local water bodies and to provide a cost-effective means of collecting water quality data. The City of Sugar Land will partner with KSLB and/or Texas Watch to train volunteers to monitor water quality. Citizens will be provided with test kits and will be asked to monitor water quality in particular areas on a monthly or quarterly basis. To ensure volunteer data is of high quality, the City will develop quality assurance standards for volunteers, and all volunteers will be required to be certified at least every two years. Volunteer efforts can provide a substantial amount of data on water quality, and this information can be used to determine which local water bodies are at risk and to identify high priority locations for more extensive sampling and analysis.

**Measurable Goals**

- Develop water quality monitoring program by Permit Year 3.
- Test sites regularly for contamination. The targeted number of sites to be tested will be set during program development and will be determined by the number of volunteers participating in the program.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Kits
    - Training for volunteers
    - Lab analysis

**Implementation Schedule**
The City will develop this program by Permit Year 3 and evaluate the resources needed/available to devote to the program. In Permit Year 3, the City will begin program implementation.

## SECTION 4 – ILLICIT DISCHARGE DETECTION AND ELIMINATION

*40 CFR 122.34 (b)(3) – Develop, implement, and enforce a program to detect and eliminate illicit discharges into your small MS4. Develop a storm sewer system map, showing the location of all outfalls and the names and locations of all waters of the U.S. that receive discharges from those outfalls. To the extent allowable under state, tribal, or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-stormwater discharges into your storm sewer system and implement appropriate enforcement procedures and actions. Develop and implement a plan to detect and address non-stormwater discharges including illegal dumping to your system. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste. Address categories listed in 122.34 (b)(3)(D)(iii) if you determine they are significant contributors of pollutants to MS4.*

### 4.0 OVERVIEW

The illicit discharge detection and elimination MCM is intended to reduce improper waste management practices. To eliminate illicit discharges into the public storm sewer system, permittees will be required to develop a strategy to detect and eliminate such discharges. An illicit discharge has been defined by the EPA as "any discharge into a separate storm sewer system that is not composed entirely of storm water."

According to the Nationwide Urban Runoff Program (NURP) study, urban dry weather discharges were found to frequently have pollutant levels high enough to significantly impact the water quality of the receiving water bodies. It is believed that most of the flow during dry weather conditions is due to illicit and/or inappropriate discharges and connections to the MS4 such as mistaken or deliberate connections of wastewater lines to the MS4. Permanent illicit connections to storm sewers – connections that often originate from businesses – allow wastewater to enter directly into storm drains and provide a continuous source of pollutants. The MS4 may also receive the illicit discharge through an indirect connection such as infiltration into the MS4 or spills flowing into storm drains.

Local governments can work toward eliminating illicit discharges to their storm system by educating citizens and businesses, updating or developing storm sewer maps, establishing local ordinances that bar the improper discharge of pollutants into the stormwater system, developing specific plans to detect and address illicit discharges, and perhaps targeting specific businesses.

**Table 4.1 BMP and measurable goal summary for Illicit Discharge Detection and Elimination.**

| BMP | MEASURABLE GOAL | PERMIT YEAR | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Ordinance | Evaluate existing ordinances and develop draft ordinance; conduct public review; present to Council for adoption, implement | X | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | ordinance | | | | | |
| Storm drainage system mapping | Evaluate GIS plan to determine if additional information is needed | X | | | | |
| | Complete date capture of all infrastructure within City limits; develop policies and procedures to update map | | X | | | |
| Illicit discharge detection and elimination program<br>-Hotline<br>-Screening, inspection, or detection program | | | | | | |
| | Set up and publicize | | | X | | |
| | Establish baseline measures | X | | | | |
| | Develop and implement program | | X | | | |
| Develop database of businesses | Develop database and update annually. | X | | | | |
| Recycling program for HHW | Hold at least one neighborhood collection per year; continue to publicize FB Recycle Center | X | | | | |
| | Consider implementation of voucher program | | | X | | |
| Septic Systems | Evaluate need for septic system inspection program; implement program, if necessary | | | X | | |

## 4.1 ILLICIT DISCHARGE ORDINANCE

**Description**

Sugar Land will develop an ordinance or modify existing ordinances to address illicit discharges to the MS4. The Public Works and Code Enforcement departments will work together to ensure compliance with the ordinance. The ordinance will prohibit illicit discharges and connections, prohibit all non-stormwater discharges that significantly contribute pollutants to the MS4, and prohibit illegal dumping. It will include appropriate enforcement procedures and actions and establish legal authority to carry out inspection surveillance and monitoring procedures necessary to ensure compliance with the ordinance. The ordinance will also identify a list of occasional incidental non-stormwater discharges that will not be addressed as illicit discharges. (Fire fighting activities are excluded from being prohibited and only need to be addressed if they are determined to be a significant contributor of pollutants to the MS4.)

To effectively detect the discharges, the City should develop an ordinance that grants the authority to inspect the properties of people suspected of releasing contaminated discharges. The ordinance can also establish enforcement actions for entities found to be in noncompliance or that refuse to allow access to their facilities. Well-conceived plans for detecting and addressing illicit discharges include procedures for locating areas likely to have illicit discharges, tracing the source of an illicit discharge, removing the source, and evaluating and assessing the program.

**Measurable Goals**

- Evaluate existing ordinances that may require modification.

- Develop a draft ordinance and/or modification.
- Conduct public review and collect comments on the draft ordinance.
- Present ordinance to City Council for adoption. Adoption of ordinance by Council.
- Implement ordinance.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Newspaper publication costs

**Implementation Schedule**
Evaluate existing ordinances, develop draft ordinance and/or modification, conduct public review, and collect comments on draft ordinance in Permit Year 1. Present ordinance to Council for adoption in Permit Year 1. Implement ordinance in Permit Year 1.

## 4.2 STORM DRAINAGE SYSTEM MAPPING

**Description**
The City of Sugar Land has created a GIS work plan and is currently in the process of developing a map of the storm drainage system that shows the waters of the U.S. and the location of storm sewer pipes, ditches, and other conveyances owned by the City. The map will also show the locations of major outfalls to the waters of the U.S. These features include:

- Any stormwater discharge from a single pipe with an inside diameter of 36 inches or more, and its equivalent (discharge from a single conveyance with a drainage area of more than 50 acres)
- For lands zoned industrial, any stormwater discharge from a single pipe with an inside diameter of 12 inches or more, and its equivalent (drainage area of 2 or more acres).

The Public Works Department has developed a GIS plan that calls for a phased building of the system for public infrastructure (water and wastewater systems, pumping facilities, storm sewer system, roadway and sidewalk system, street lighting, drainage ditches, basins, etc.). Currently, details are being finalized for all infrastructure within the City limits north of US 90A. Completion of the Public Works GIS project will provide graphic representation of all infrastructure within the City limits south of US 90A. It is estimated that the GIS project will be completed by Permit Year 2. Recurring funds have been requested to provide updates to the system and to scan construction plans on an annual basis. Future year funding will be requested to complete development of all infrastructure within the City's ETJ and to integrate the AS/400 work order system data into GIS, which will attach an enormous amount of historical information to specific locations and appurtenances.

The completion of the Public Works GIS plan will provide the City with a comprehensive overall layout of all public infrastructure networks. The City will evaluate the GIS system to determine if additional information is needed to better serve the purposes of the SWMP.

An up-to-date storm sewer map is crucial to detecting and removing any illicit sewer connections and thereby eliminating illicit discharges. The Public Works department will need to develop policies and procedures to ensure that the map is kept current once the GIS system is completed. The City currently requires developers to provide GIS-compatible electronic files of commercial and residential development drawings. These files are integrated into an overall City drainage system map. Some ongoing field verification may be necessary to keep the map up-to-date. Additional city drainage features that are located in areas outside the coverage of the developer-provided drawings will be identified and located by field surveying or GPS and included on the drainage system map.

**Measurable Goals**

- Evaluate GIS plan to determine if additional information is needed to better manage stormwater quality.
- Complete data capture of all infrastructure within the City limits.
- Develop policies and procedures to ensure that the GIS system is kept current once the initial infrastructure is completed.
- Evaluate the need to require developers to provide GIS-compatible electronic files.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**

Evaluate GIS plan to determine if additional information is needed to better manage stormwater quality in Permit Year 1. Complete data capture of all infrastructure within the City limits in Permit Year 2. Develop policies and procedures to update map in Permit Year 2. Evaluate the need to require developers to provide GIS-compatible electronic files in Permit Year 2.

## 4.3 ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The illicit discharge detection and elimination program will include the following components.

### *4.3.1 Illicit Discharge/Dumping Hotline*

**Description**
Sugar Land will develop procedures for receipt and consideration of information submitted by the public regarding illicit discharges, including illegal dumping. This hotline can be combined with the construction site reporting hotline. This stormwater/environmental hotline will facilitate the ability of the public to provide information that will assist in the detection of problem discharges. Public Works currently responds to citizen requests and performs construction inspections; therefore, little or no additional cost may be associated with this activity. Another consideration may be to have an additional phone line that can be publicized for reporting illicit discharges and dumping. Procedures will need to be established on who will answer the calls, how they will be documented, and who will respond to the calls. Printed educational materials and slides displayed on the municipal cable channel would include the environmental hotline number.

**Measurable Goals**

- Set up hotline.
- Publicize hotline.
- Respond to complaints throughout permit term.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – May need a dedicated phone line

**Implementation Schedule**
Set up reporting hotline and publicize it in Permit Year 3. Respond to complaints throughout permit term.

### *4.3.2 Screening, Inspection, or Detection Program*

**Description**

A range of options is available to address illicit discharge detection and elimination. These can be outfall-oriented such as dry-weather screening or source-oriented such as business site inspections. The City will develop a program that uses a combination of complaint-driven investigations and active detection and resolution. Active detection and resolution would start with screening of outfalls for dry-weather flow, investigating dry-weather flows to identify the source, and working with the responsible party to eliminate it. Dry-weather screening is weather-dependant, and may be difficult since in the south of the City many of the outfalls are submerged; other activities can occur during wet-weather conditions. The City currently inspects for health and construction-related reasons and responds to citizen contacts regarding streets, drainage, and traffic.

**Measurable Goals**

- Establish baseline measures.

- Develop screening, inspection, or detection program and determine available resources.
- Develop protocol and identify major/priority outfalls.
- Implement screening, inspection, or detection program.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Training in sampling and screening techniques
    - Field screening and sampling equipment
        - Manhole hooks
        - Sampling poles
        - Storage bins
        - Digital camera
        - Coolers
        - Colorimeter
        - Gloves, rubber boots
        - Safety gear (vests, traffic cones, etc.)
        - Flashlights
    - Maps of stormwater drainage system
    - Laboratory analysis

**Implementation Schedule**
Establish baseline measures for dry and wet weather in Permit Year 1. Develop screening, inspection, or detection program and determine available resources in Permit Year 2. Develop protocol in Permit Year 2. Implement screening, inspection or detection program in Permit Year 2, following adoption of ordinance.

## 4.4 DEVELOP DATABASE OF BUSINESSES

**Description**
Sugar Land maintains a database of businesses in the municipality. This database will assist in distribution of public education materials and in identifying businesses that may be contributing illicit discharges. Mapping the businesses or listing key map locations provides additional information that will assist in investigating illicit discharges. The City could acquire Standard Industrial Classification (SIC) codes of these businesses from the State Comptroller's office. This will tell which businesses should have their own stormwater permit coverage. TCEQ has a database of businesses that have applied for permit coverage. This BMP will help prioritize educational and enforcement efforts for illicit discharges from businesses.

**Measurable Goals**

- Update database annually.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**
Ongoing.

## 4.5 RECYCLING PROGRAM FOR HOUSEHOLD HAZARDOUS WASTE

**Description**
The City of Sugar Land and KSLB, in conjunction with the Fort Bend County Engineering Department and Recycling Center, conduct periodic neighborhood collections of batteries, oil, latex paint, and antifreeze (BOPA) and or consumer electronics. The purpose of these mobile collection events is to provide convenient drop-off points for residents to bring in non-combustible hazardous waste. Residents who arrive with unacceptable items are directed to go the County's Household Hazardous Waste (HHW) Collection Center in Rosenberg.

In addition to supporting mobile BOPA/electronics collections, the City publicizes the Fort Bend Recycling Center. Items accepted at this facility (year-round) include batteries, motor oil, oil filters, latex paint, antifreeze, transmission oil, power steering fluid, cooking oil, consumer electronics, and other recyclables. The City encourages residents to take their household hazardous waste to the Fort Bend County HHW Collection Center. HHW items accepted at this facility include flammables, caustics, reactives, toxics, and unknown chemicals.

The County recently began charging a minimal fee to recycle HHW items. As part of the stormwater management plan, Sugar Land will consider implementing a voucher program for residents who use the Fort Bend Recycling Center.

**Measurable Goals**

- Continue to hold at least one neighborhood BOPA or electronics collection each year, provided that funds are available to support the event.
- Continue to publicize Fort Bend County's Recycling and HHW Collection Center through the website and in community newsletters.
- Consider implementation of a voucher program for the Fort Bend Recycling Center in Permit Year 3.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Cost of voucher program, if implemented

**Implementation Schedule**
Ongoing.

## 4.6 SEPTIC SYSTEMS

**Description**
Sugar Land will evaluate the need to implement a septic system inspection program. As part of this program, Sugar Land would require/facilitate repair of septic systems that are failing to treat wastewater properly. The City of Sugar Land has only a handful of remaining septic systems within the City limits. There is an ordinance in place that prohibits installation of new septic systems within the corporate City limits. For new developments outside the City limits but within the City's extraterritorial jurisdiction, the County allows septic systems to be installed only on properties that are larger than one acre. A septic system inspection program would facilitate improvement of failing septic systems and reduce potential contamination of surface and groundwater, including water supply wells. Sugar Land could field screen areas for indicators of failing systems and/or modify systems to ensure proper treatment.

**Measurable Goals**

- Evaluate the need to implement a septic system inspection program.
- Develop program, if deemed necessary.
- Respond to 100% of complaints.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
    - Dye testing kits
    - Lab analyses (fecal coliform)

**Implementation Schedule**
Respond to complaints throughout permit term. Evaluate the need to implement a septic system inspection program in Permit Year 3. Develop investigation protocol in Permit Year 3, if program is deemed necessary.

## SECTION 5 – CONTROL OF CONSTRUCTION SITE RUNOFF

*40 CFR 122.34 (b)(4) – Develop, implement and enforce a program to reduce pollutants in any stormwater runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Program must include: the development and implementation of (at a minimum) an ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, requirements for construction site operators to implement appropriated erosion and sediment control BMPs, requirements for construction site operators to control waste at the construction site, procedures for site plan review which incorporate consideration of potential water quality impacts, procedures for receipt and consideration of information submitted by the public.*

### 5.0 OVERVIEW

Construction site stormwater runoff control is a MCM designed to address the pollution of stormwater runoff from construction sites. During construction activity, vegetation and topsoil can be stripped away, making the area especially vulnerable to erosion and additional sediment in local water. Activities that are performed on construction sites usually disturb a large amount of land and generate large amounts of waste. This has generally been found to lead to high levels of sediment, phosphorus, nitrogen, pesticides, petroleum derivatives, construction chemicals, and solid wastes in receiving streams nationwide.

Several actions must be taken under this MCM to deal with these pollutants. First, construction sites must be required, through ordinances and procedures, to establish erosion and sediment controls (in compliance with the Stormwater Construction general permit). To reduce construction runoff, local governments can develop ordinances for control of erosion and sediment, educate construction site operators about erosion and waste control practices, and inspect sites to ensure the appropriate management practices are followed. A mechanism to enforce compliance must also be established with the regulation or ordinance to ensure that the necessary controls are implemented. Finally, the MS4 must establish procedures for site plan review and receipt and consideration of public input. In review of construction site plans, City staff can look for potential problems, and they can perform inspections to ensure construction site operators are complying with local ordinance provisions.

**Table 5.1 BMP and measurable goal summary for Control of Construction Site Runoff.**

| BMP | MEASURABLE GOAL | PERMIT YEAR | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Ordinance | Evaluate existing ordinances and develop draft ordinance; conduct public review; present to Council for adoption, implement ordinance | X | | | | |
| Site plan review program | Evaluate current review process | X | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | and develop criteria checklists | | | | | |
| | Begin review of submitted plans and begin pre-construction site visits | | X | | | |
| Site inspection program | Applicable employees to attend training class; develop procedure checklists; inspect construction sites | X | | | | |
| Reporting hotline | Set up and publicize hotline | | | X | | |
| Contractor education program | Develop materials; distribute materials; incorporate into pre-construction meetings | | X | | | |

## 5.1 CONSTRUCTION SITE RUNOFF CONTROL ORDINANCE

**Description**

Sugar Land will evaluate the existing legal authority to enforce the requirements for erosion and sediment controls and proper waste management at construction sites, as well as the sanctions to ensure compliance with the requirements. Sugar Land will develop an ordinance or modify existing ordinances to require erosion and sediment controls, as well as sanctions to ensure compliance.

The ordinance will mandate that construction site operators put up, maintain, and properly dispose of erosion and sediment controls. The ordinance can mandate BMPs for erosion and sediment control and prescribe fines, bonding requirements, and/or permit denials in cases of noncompliance. The ordinance will allow the City to develop, implement, and enforce a program to reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Also included are projects less than one acre that are part of a larger common plan of development or sale that discharge to the small MS4. This program will provide for site plan review, receipt and consideration of information submitted by the public, site inspection, and enforcement of control measures. The ordinance may reference the TPDES general permit No. TXR150000 for construction sites in Texas.

Construction site contractors must, at a minimum, implement appropriate erosion and sediment control BMPs and control waste such as discarded building materials, concrete truck washout water, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality.

**Measurable Goals**

- Evaluate existing ordinances that may require modification.
- Develop draft ordinance and/or modification.
- Conduct public review and collect comments on draft ordinance.
- Present ordinance to City Council. Adoption of ordinance by Council.
- Implement ordinance.

**Costs**

- Labor – 1/3 full-time employee (FTE) in Permit Year 2
- Equipment/Supplies – 1/3 of equipment for FTE

**Implementation Schedule**
Evaluate existing ordinances and develop draft ordinance and/or modification, Conduct public review and collect comments on draft ordinance, and present ordinance to Council for adoption in Permit Year 1. Implement ordinance upon council adoption.

## 5.2 SITE PLAN REVIEW PROGRAM

**Description**
Existing procedures require site plan review and approval by the Development Review Committee (DRC) prior to the initiation of construction activities. City staff will evaluate the site plan review process and develop procedures for a site plan review program that incorporates consideration of potential water quality effects of construction activities. The site plan review will include review of Stormwater Pollution Prevention Plans (SWP3) and will consider the nature of construction, the topography of the site, soil characteristics of the site, and condition of receiving stream for stormwater runoff. Site visits may be conducted to evaluate this information. This evaluation would allow the City/Development Review Committee to identify areas of concern that would potentially have a greater impact on water quality. Forms, checklists, and a standard format for submission of plans will be developed or revised for the review program.

**Measurable Goals**

- Evaluate current review process for stormwater quality.
- Develop criteria checklists.
- Begin review of submitted plans.
- Pre-construction site visits to a specified percentage of construction projects.

**Costs**

- Labor – 1/3 full-time employee (FTE) in Permit Year 2
- Equipment/Supplies – 1/3 of equipment for FTE

**Implementation Schedule**
Evaluate current review process for stormwater quality in Permit Year 1. Develop criteria checklists in Permit Year 1. Review all submitted plans beginning in Permit Year 2. Begin pre-construction site visits in Permit Year 2. Number of sites visited will depend on available departmental resources within Public Works.

## 5.3 SITE INSPECTION PROGRAM

**Description**

Sugar Land will develop procedures for a construction site inspection program and enforcement of controls. Stormwater controls will be included in all City construction inspections. Noncompliance will be cause for the City to stop inspections, thereby halting construction until the situation is remedied. Extended noncompliance may also result in a fine. This will communicate to contractors the importance of erosion and sediment controls and waste management. Site inspections will help establish consistency in how requirements are addressed. Site inspectors will need to have training on stormwater quality, which is available from the EPA. Forms, checklists, and protocol for inspection of sites will be developed. Construction site inspections will ensure that the contractor is adhering to the SWP3 that was submitted.

**Measurable Goals**

- Applicable employees to attend training program for inspections.
- Develop procedure checklists.
- Inspect a specified percentage of construction sites.
- Resolve all noncompliances in a timely manner; number of days to be determined during program development.

**Costs**

- Labor – 1/3 full-time employee (FTE) in Permit Year 2
- Equipment/Supplies
    - 1/3 of equipment for FTE
    - Training costs

**Implementation Schedule**

Applicable employees will attend EPA training program for inspections in Permit Year 1. Develop procedure checklists in Permit Year 1. Begin site inspection in Permit Year 1, and increase the number of inspections in Permit Year 2.

## 5.4 REPORTING HOTLINE

**Description**

Sugar Land will develop procedures for receipt and consideration of information submitted by the public regarding construction site stormwater controls. This hotline can be combined with the illicit discharge hotline. This environmental hotline will facilitate the ability of the public to provide information that will assist in the detection of problem discharges. Public Works currently responds to citizen requests and performs construction inspections; therefore, little or no additional cost may be associated with this activity. Another consideration may be to have an additional phone line that can be publicized for reporting illicit discharges and dumping. Procedures will need to be established on who will answer the calls, how they will be documented, and who will respond to the calls. Printed educational materials and slides displayed on the municipal cable channel would include the environmental hotline number.

**Measurable Goals**

- Set up reporting hotline
- Publicize reporting hotline
- Respond to all reports (within a specified number of days)

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – May or may not need a dedicated phone line

**Implementation Schedule**
Set up reporting hotline and publicize it in Permit Year 3. Respond to complaints throughout permit term.

## 5.5 CONTRACTOR EDUCATION PROGRAM

**Description**
Sugar Land will conduct an outreach program and prepare informational outreach materials for the development community. An informational brochure regarding changes in development requirements will be created. Sugar Land currently conducts one-on-one pre-construction meetings with contractors regarding construction projects in the City. Sugar Land will incorporate stormwater pollution minimization training for site operators and compliance with the stormwater construction general permit into these meetings.

The City will develop or acquire a public education brochure or flyer to inform the public and construction site operators of the requirements for stormwater controls. Sugar Land could adopt NAHB's *Guide for Builders and Developers* or City of Houston and Harris County's *Storm Water Management Handbook for Construction Activities* that provides guidance on compliance with the Construction General Permit. The construction handbook was developed by the City of Houston and Harris County to facilitate local compliance with the Construction General Permit and is widely distributed to contractors in the local area. Contractors would be directed to use the handbook for guidance in complying with the state construction general permit. The City could also distribute or make copies available as contractors apply for construction permits. The City can require contractors to obtain the manual. No cost would be incurred by the City. This is an existing document, which would only need to be adopted.

Sugar Land will promote good housekeeping education for construction site operation. City staff can develop informational materials to educate construction operators about specific erosion and sediment control measures such as land grading, berms, and riprap, as well as general construction site waste management techniques such as trash disposal, recycling, proper material handling, spill prevention, and cleanup measures.

**Measurable Goals**

- Develop or acquire public education materials.
- Incorporate education into pre-construction meetings
- Distribute education materials to contractors applying for construction permits.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Printed education materials

**Implementation Schedule**

Develop or acquire public education materials in Permit Year 2. Incorporate education into pre-construction meetings in Permit Year 2. Begin distributing education materials in Permit Year 2.

## SECTION 6 – POST-CONSTRUCTION STORMWATER MANAGEMENT

*40 CFR 122.34 (b)(5) – Develop, implement and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects that are less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4. Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for your community. Use an ordinance or other regulatory mechanism to address post-construction runoff. Ensure adequate long-term operation and maintenance of BMPs.*

### 6.0 OVERVIEW

Post-construction stormwater management in new development and redevelopment focuses on implementation of controls to maintain good water quality conditions after an area has been developed. New development can also have a significant effect on water quality because during the course of development, natural landscapes are often replaced by impermeable roads, parking lots, sidewalks and other paved surfaces that lead to increases in both the volume of stormwater runoff and the accompanying pollutants that reach local water bodies.

The MS4s are required to develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale that discharge to the small MS4. The program must ensure that controls are in place that would prevent or minimize water quality impacts.

Studies have shown that it is much easier and more cost-effective to control pollution at its source rather than after it enters into an MS4. It is important to consider BMPs that may be needed for post-construction pollution control prior to the construction. Strategies should include a combination of structural and non-structural BMPs appropriate for the community.

Structural controls include use of storage, infiltration, and vegetative practices. Local governments can use preventative practices such as buffer zones, zoning, or requirements that new development implement specific structural BMPs. Buffer zones are areas along water bodies where development is restricted or prohibited. They separate water bodies from development, making it more difficult for polluted stormwater to reach the body of water. The natural terrain of the buffer zone can also absorb excess runoff and cleanse pollutants as runoff moves through it. Local ordinances can require developers to use porous pavement or swales and can grant local governments the authority to inspect development and sites and enforce ordinances.

Non-structural controls include planning and procedures and site-based local controls. Zoning ordinances can prevent development in sensitive areas, and promote development in areas that can better accommodate development. Minimization of impervious areas,

wetland protection, and vegetated drainage ways are some of the non-structural controls that may be considered for use during the design of a new development or redevelopment project.

The chosen BMPs should be appropriate for the community served, minimize water quality impacts, and try to maintain pre-development runoff conditions. Regulations and ordinances will be created to establish requirements for post-construction runoff from new development and redevelopment projects. The MS4 needs to develop a mechanism to ensure that there is long-term operation and maintenance of the BMPs.

**Table 6.1 BMP and measurable goal summary for Post-Construction Stormwater Management.**

| BMP | MEASURABLE GOAL | PERMIT YEAR | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Ordinance | Evaluate existing ordinances and develop draft ordinance; conduct public review | | | X | | |
| | Present to Council for adoption, implement ordinance | | | | X | |
| Revise Development Review Procedures | Evaluate existing procedures, make revisions, and implement new procedures | | | X | | |
| Encourage low impact designs | Research; evaluate; modify design standards | | | | X | |
| Inspection of completed projects | Check all completed projects for implementation of structural controls; begin annual inspections | | | | X | |
| Long-term inspection and maintenance plan requirements | Implement procedures/checklist to review development plans for provision of long-term inspection and maintenance | | | | X | |
| Evaluate regional ponds | Add stormwater quality to design consideration | | X | | | |
| | Evaluate need to program to monitor detention ponds; evaluate need for ordinance requiring detention pond maintenance | | | X | | |
| | Adopt ordinance and implement program, if necessary | | | | X | |

## 6.1 POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT ORDINANCE

**Description**

Sugar Land will develop an ordinance or modify existing ordinances to require management of post-construction stormwater in new development and redevelopment. The ordinance will allow the City to develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that

disturb one acre or more. Also included are projects less than one acre that are part of a larger common plan of development or sale that will result in the disturbance of one or more acres that discharge into the small MS4.

In developing this ordinance, Sugar Land must decide at what level stormwater management standards of redevelopment projects will be held. Providing cost effective stormwater treatment at redevelopment sites is often difficult, and these projects may be given reduced criteria to meet or non-structural requirements to allow for site constraints. Sugar Land may also consider use of its regional drainage system for permanent structural controls of stormwater quality where available. Such an ordinance might consider the following areas:

- Site development project proposal
- Conceptual stormwater management plan
- Agency review
- Final stormwater management plan design/construction drawings
- Easements/covenants for operation and maintenance secured
- Performance bond/security
- Construction inspection
- Maintenance and repair requirements
- Enforcement measures
- City installation of stormwater runoff control measures

**Measurable Goals**

- Evaluate existing ordinances that may require modification.
- Develop draft ordinance and/or modification.
- Conduct public review and collect comments on draft ordinance.
- Present ordinance to City Council. Adoption of ordinance by Council.
- Implement ordinance.

**Costs**

- Labor
    - Consultant assistance in Permit Year 3
    - 1/4 FTE in Permit Year 4
- Equipment/Supplies
    - 1/4 of equipment for FTE

**Implementation Schedule**

Evaluate existing ordinances and develop a draft ordinance and/or modification in Permit Year 3. Conduct public review and collect comments on draft ordinance in Permit Year

3. Present ordinance to Council for adoption in Permit Year 4. Implement ordinance in Permit Year 4.

## 6.2 REVISE DEVELOPMENT REVIEW PROCEDURES

**Description**
Sugar Land will integrate post-construction stormwater quality requirements into inspection programs. Sugar Land will revise development review procedures to address ordinance changes requiring post-construction controls for new development and redevelopment in areas where regional ponds are not suitable for retrofit. The Development Review Committee (DRC) will incorporate the review of stormwater quality features into the plan review process to ensure that stormwater quality objectives are addressed at an early stage of the development. City staff will evaluate the review process to address ordinance changes. Forms and checklists for development review will be revised accordingly.

**Measurable Goals**

- Review existing procedures.
- Update existing procedures.
- Implement updated procedures.

**Costs**

- Labor – Consultant assistance in Permit Year 3
- Equipment/Supplies – N/A

**Implementation Schedule**
Review and update existing procedures in Permit Year 3. Implement updated procedures in Permit Year 3.

## 6.3 ENCOURAGE LOW IMPACT STORMWATER DESIGNS

**Description**
Sugar Land may modify development design criteria to allow low impact stormwater designs where these alternatives do not conflict with other code requirements. Sugar Land will actively support use of development practices commonly referred to as low-impact design, conservation development, or open space development. Such design alternatives include:

- Low impact development
- Narrower residential streets
- Eliminating curb and gutters
- Green parking
- Alternative turnarounds

- Alternative pavers
- Buffer zones
- Open space design
- Conservation easements

These design alternatives strive to maintain pre-development stormwater quality conditions, so that downstream structural controls are not necessary. Some of these alternatives may be compatible with master-planned communities and floodplain management. Some developers are considering these options to minimize loss of buildable land to stormwater quality impoundments. City staff will incorporate allowance for low stormwater impact designs into the plan review process and into guidance manuals.

**Measurable Goals**

- Modify design standards to allow alternative designs.

**Costs**

- Labor – Consultant assistance in Permit Year 4
- Equipment/Supplies – N/A

**Implementation Schedule**
Research and evaluate in Permit Year 4. Modify design standards to allow alternative low stormwater quality impact design in Permit Year 4.

## 6.4 INSPECTION OF COMPLETED PROJECTS

**Description**
Inspectors will check completed projects for proper construction of permanent structural controls in compliance with approved plans. Checking for proper installation before signing off on a project is necessary to correct potential defects. The proper construction of permanent controls is necessary for the success of the inspection and maintenance requirements. Inspectors will need to have training on stormwater quality design criteria. Inspection forms and checklists for inspection of permanent stormwater quality structural controls will be developed.

**Measurable Goals**

- Check all completed projects for implementation of structural controls.
- Inspect all structural controls annually to ensure that maintenance is performed.

**Costs**

- Labor – 1/4 FTE in Permit Year 4
- Equipment/Supplies – 1/4 of equipment for FTE

**Implementation Schedule**
Begin checking all completed projects in Permit Year 4.

## 6.5 LONG-TERM INSPECTION AND MAINTENANCE PLAN REQUIREMENTS FOR STORMWATER STRUCTURAL CONTROLS

**Description**
Sugar Land will integrate post-construction stormwater quality requirements into the plan review program. The City then will revise the plan review process to require developers of commercial and residential property to submit plans and provisions for long-term inspection and maintenance of any structural controls implemented to maintain stormwater quality. Depending on the ordinance development process, an annual permitting system may be needed to assure proper inspection and maintenance of these structural controls. Alternatively, the City may take over responsibility for maintenance of these structures. Routine inspection and maintenance help to identify and repair problems before they become serious. Maintaining proper functioning of structural controls reduces the chance of polluting stormwater runoff with subsequent rain events.

**Measurable Goals**

- Implement procedure/checklist to review development plans for provision of long-term inspection and maintenance.

**Costs**

- Labor – 1/4 FTE in Permit Year 4
- Equipment/Supplies – 1/4 of equipment for FTE

**Implementation Schedule**

- Implement procedure/checklist to review development plans for provision of long-term inspection and maintenance in Permit Year 4.

## 6.6 EVALUATE REGIONAL PONDS FOR STORMWATER QUALITY

**Description**
Sugar Land will evaluate existing and planned regional detention ponds for potential modification to incorporate stormwater quality features. Existing ponds will be evaluated for feasibility of retrofit to incorporate stormwater quality features that may improve the quality of the stormwater discharged. The ability to use regional drainage features for stormwater quality treatment could reduce direct impact of the stormwater quality program on new development and redevelopment projects in some watersheds.

**Measurable Goals**

- Evaluate need for ordinance requiring maintenance of detention ponds.

- Adopt ordinance, if deemed necessary.
- Add stormwater quality to design considerations for regional detention ponds.
- Evaluate the need for a program to monitor detention ponds.
- Implement detention pond monitoring program.

**Costs**

- Labor
    - Consultant assistance in Permit Years 2 and 3
    - 1/4 FTE in Permit Year 4
- Equipment/Supplies – 1/4 of equipment for FTE

**Implementation Schedule**

Add stormwater quality to design considerations for regional detention ponds in Permit Year 2. Evaluate the need for a program to monitor detention ponds in Permit Year 3. Evaluate the need for ordinance requiring maintenance of detention ponds in Permit Year 3. Adopt ordinance in Permit Year 4, if deemed necessary. Implement detention pond monitoring program in Permit Year 4, if deemed necessary.

## SECTION 7 – POLLUTION PREVENTION AND GOOD HOUSEKEEPING

*40 CFR 122.34 (b)(6) – Develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.*

### 7.0 OVERVIEW

Many opportunities for preventing stormwater pollution can be found within a local government's own operations. This MCM emphasizes the operation and maintenance of MS4s and proper training of municipal employees. Altering daily operations that have the potential to contribute pollutants to stormwater and establishing schedules for cleaning and maintaining infrastructure can have positive effects on water quality. When local governments take advantage of pollution prevention opportunities within their own operations, results are often swift because improvements do not have to rely on gradual changes in citizen behavior. Typical affected municipal operations include parks, open space maintenance, road and right-of-way maintenance, fleet maintenance, city construction projects, and stormwater system maintenance. The following items should be considered:

- Maintenance activities and schedules
- Long-term inspection procedures for structural and non-structural stormwater controls
- Controls for reducing/eliminating discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops, sand storage locations, and waste transfer and disposal facilities.
- Procedures for properly disposing of waste removed from the separate storm sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris)
- Ensuring that new and existing flood management projects assess the impacts on water quality

**Table 7.1 BMP and measurable goal summary for Pollution Prevention and Good Housekeeping.**

| BMP | MEASURABLE GOAL | PERMIT YEAR | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Structural control maintenance | Develop inventory of structural controls; develop inspection and maintenance schedule | | | X | | |
| | Implement inspection and maintenance program | | | | X | |
| Waste disposal | Develop stormwater waste management procedures; train employees on proper waste management | | | X | | |
| Employee/Contractor Education Program | Develop training modules; | | | X | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | implement training program | | | | | |
| Outdoor storage | Inventory all storage locations; identify discarded materials; evaluate facilities annually | | X | | | |
| Street sweeping | Monitor build-up of litter and sediment and make street sweeping recommendation | | | X | | |
| | Implement recommendation | | | | X | |
| Fleet and equipment maintenance | Assess vehicle maintenance locations; evaluate maintenance schedule of catch basins; develop training program | | X | | | |
| | Install additional catch basins, if necessary | | | X | | |
| | Evaluate fleet operations to determine additional measures to be taken, if any | | | | X | |
| Vehicle and equipment washing | Evaluate drainage and wash facilities and make recommendation | | X | | | |
| | Implement recommendation | | | X | | |
| Spill prevention and response | Provide spill response kits and training | | X | | | |
| Facility inspection program | Develop list of facilities to be inspected; develop inspection procedures | | X | | | |
| | Implement inspection program | | | X | | |
| Erosion/sediment control | Develop comprehensive soil erosion and sediment controls for municipal construction projects | | | X | | |
| Landscaping | Develop training materials; implement training program, change contract verbiage | | | X | | |
| Open space management | Evaluate need for policy | | X | | | |
| | implement policy, if deemed necessary | | | X | | |

## 7.1 STRUCTURAL CONTROL MAINTENANCE

**Description**

As part of the evaluation of the existing regional stormwater management system, an inventory of existing city-managed structural controls will be established. Structural approaches to managing stormwater are actual structures that physically prevent, inhibit, or slow the rate at which pollutants reach water bodies. An inspection and maintenance schedule will be established for these structural controls to promote their effective operation for stormwater quality treatment. Pollution can be prevented by establishing schedules for the periodic cleaning of storm drain systems. Regular cleaning of catch basins, drain pipes, and other system components. This can reduce suspended sediment and oxygen dissolving materials in stormwater, as well as prolong the life of the system.

**Measurable Goals**

- Develop inventory of City structural controls.
- Develop inspection and maintenance schedule.
- Implement inspection and maintenance program.

**Costs**

- Labor – Existing City staff
- Equipment Supplies – TBD

**Implementation Schedule**
Develop inventory of City structural controls in Permit Year 3. Develop inspection and maintenance schedule and evaluate resource needs in Permit Year 3. Implement inspection and maintenance program in Permit Year 4.

## 7.2 WASTE DISPOSAL

**Description**
Sugar Land will establish a procedure for proper disposal of wastes including dredge spoil, accumulated sediments, and floatables removed from the MS4, removed from structural controls, or collected as a result of municipal operations and maintenance activities. Procedures will be developed to determine when to sample, and employees will be trained. For example, a representative sediment sample may be collected and analyzed as maintenance is performed in drainage areas or major structures, unless representative data of information already exists. This will provide the basis for determining proper disposal of wastes generated in the drainage area or structure (e.g., sediment accumulated in industrial areas may have a higher potential for contamination, and would have different disposal procedures). Areas would be resampled when the City has reason to believe there could be a change in the characteristics, and maintenance activities are occurring in that area.

**Measurable Goals**

- Develop stormwater waste management procedures.
- Train employees on proper stormwater waste management procedures.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**
Develop stormwater waste management procedure in Permit Year 3. Train employees on proper stormwater waste management procedures in Permit Year 3.

## 7.3 EMPLOYEE/CONTRACTOR EDUCATION PROGRAM

**Description**
Sugar Land will develop and provide employee training to prevent and reduce stormwater pollution from activities such as park maintenance, fleet and building maintenance, new construction, land disturbance, and stormwater system maintenance. Training programs ensure that stormwater quality programs are properly implemented and BMPs are properly installed and maintained. Ensuring proper management practices can reduce the need for costly structural controls. Stormwater quality training would also be incorporated into new employee orientation. Ongoing training and review on various topics would take place at the required monthly safety meetings.

The City will need to develop a curriculum for a training course and commit employees to teaching and/or receiving the training. Training modules may include:

- Proper fueling techniques
- Good housekeeping and material management practices
- Spill prevention, response, and notification procedures
- Proper waste handling procedures
- Proper tank and drum filling and transfer procedures
- Proper vehicle and equipment cleaning procedures
- Proper painting, sanding, blasting, and refinishing techniques
- Inspection procedures
- Temporary sediment control measures
- Stormwater sampling techniques

**Measurable Goals**

- Develop training modules.
- Provide training to municipal operations employees and their contractors, as applicable.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Training materials

**Implementation Schedule**
Develop training modules by Permit Year 3. Municipal employee training will begin in Permit Year 3.

## 7.4 OUTDOOR STORAGE

**Description**

Stockpiles and used equipment are potential sources of stormwater pollution. Sugar Land will evaluate its facilities to ensure that usable materials are being stored properly and that unusable materials are being disposed of properly. The goal of this BMP is to prevent stored materials or any pollutant associated with them from reaching local waterways. This is accomplished through a variety of means, including covering stockpiles under a roof or tarp, diking storage areas to prevent runoff, or collecting the runoff and providing for its treatment.

The Service Center and other municipal facilities currently remove and dispose of stockpiled materials that are unusable or not intended for reuse. The City will evaluate its facilities as part of the annual self-audit to ensure that unusable materials are being disposed of properly and in a timely manner. Some of the stored materials may not be in usable condition or will not be reused. Any materials (concrete, metal, rock, sand, debris, old equipment) that are exposed to precipitation need to be recycled or disposed of properly if they are not intended for reuse. This will clear space that could be better utilized and aid in the reduction of sediment, heavy metals, oil and grease, and other pollutants. Some materials may require testing before proper disposition.

**Measurable Goals**

- Inventory all storage locations and assess the adequacy of the protection provided at existing storage areas.
- Identify discarded materials at municipal operations.
- Recycle or properly dispose of materials that are not needed at the municipal operations sites.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Dependent on the materials and method of disposal

**Implementation Schedule**

Inventory all storage locations and assess the adequacy of the protection provided at existing storage areas in Permit Year 2. Identify any discarded materials at municipal operations and remove non-usable materials in Permit Year 2. Evaluate facilities each Permit Year, beginning in Permit Year 2, to ensure that unusable materials are being disposed of properly and in a timely manner.

## 7.5 STREET SWEEPING

**Description**

Street sweeping can capture substantial amount of solids and other pollutants from street surfaces before they are washed into the storm drainage system and discharged into local waterways. Sugar Land will evaluate the frequency of street sweeping and prioritize areas by pollution potential. The City will then determine whether increased street sweeping would be beneficial to its stormwater management effort.

Sugar Land currently budgets approximately $46,000 per year to fund 40 hours per month of street sweeping. The City's street sweeping program targets boulevards and major intersections along Highway 6, Highway 90, and Eldridge Road, and municipal parking lots. Currently, the City does not sweep in front of residential homes unless the home is located on a major roadway.

The City will evaluate the need to increase contracted services for street sweeping or to purchase a street sweeper. The City does not currently have a street sweeper in its fleet. If the City deems it necessary to purchase a sweeper, capital costs for a conventional sweeper would range from $60,000 to $120,000. A newer technology sweeper would cost approximately $180,000. In addition, operation and maintenance costs are approximately $30 per curb mile for conventional sweepers and $15 per curb mile for newer technology sweepers. The average cost for street cleaning is estimated at $68 per curb mile at 11 curb miles per day.

Materials swept up from streets have a significant pollution potential and must be disposed of properly. Personnel operating street-sweeping equipment should be trained in proper collection, handling, and disposal methods. Most street sweeping debris can be disposed of in a Type II landfill, with costs ranging from $10 to $20 per cubic yard. If street sweeping is contracted out, the estimated cost for capital investment, operation and maintenance, and disposal may range from $130 to $150 per curb mile.

**Measurable Goals**

- Monitor the build-up of litter and sediment in priority areas and make a schedule recommendation based on a cost-benefit analysis.
- Evaluate need for additional equipment or contract services.
- Implement schedule recommendation.

**Costs**

- Labor – To be determined
- Equipment/Supplies – To be determined

**Implementation Schedule**
Monitor the build-up of litter and sediment between sweepings and make a schedule recommendation in Permit Year 3. Evaluate need for additional equipment or contract services in Permit Year 3. Implement schedule recommendation in Permit Year 4.

## 7.6 FLEET AND EQUIPMENT MAINTENANCE

**Description**
Sugar Land will inventory all vehicle maintenance locations. The City will assess if stored products are protected from the elements and if they are adequately protected from spillage. The review of handling and disposal of waste products is another consideration

of this activity. The goal is to reduce the wash off of pollutants from these facilities. The wash down water from the Public Works fleet maintenance facility flows into an oil separator and is then routed to the storm sewer system. The City will evaluate the maintenance schedule of this catch basin and determine if improvements or additional catch basins and/or oil/grit separators are needed.

Sugar Land will develop and implement a training program that addresses the proper methods of storing, handling, and disposing of vehicle maintenance materials. Maintenance sites should be inspected and spill responses should be documented. The City will evaluate its fleet operations to determine what additional measures can be taken to reduce pollutants.

**Measurable Goals**

- Inventory all vehicle maintenance locations and assess if stored products are protected from the elements and if they are adequately protected from spillage.
- Evaluate maintenance schedule of the catch basins and determine if improvements are needed.
- Develop training program that addresses the proper methods of storing, handling, and disposing of vehicle maintenance materials.
- Implement training program.
- Evaluate need for a catch basin at the designated location for drivers to grease backhoes. Monitor procedures to ensure that all drivers are greasing the backhoes at the designated location.
- Install catch basin at the designated location for greasing backhoes, if deemed necessary.
- Evaluate fleet operations to determine what additional measures can be taken to reduce pollutants.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – To be determined

**Implementation Schedule**

Inventory all vehicle maintenance locations and assess if stored products are protected from the elements and if they are adequately protected from spillage in Permit Year 2. Evaluate maintenance schedule of the catch basin at the fleet maintenance facility and determine if improvements are needed in Permit Year 2. Develop training program in Permit Year 2. Implement training program Permit Year 2. By Permit Year 3, evaluate need for a catch basin at designated location for greasing backhoes, and monitor procedures to ensure that all drivers are greasing the backhoes at the proper location. Install catch basin in Permit Year 3, if deemed necessary. In Permit Year 4, evaluate fleet operations to determine what additional measures can be taken to reduce pollutants.

## 7.7 VEHICLE AND EQUIPMENT WASHING

**Description**
Sugar Land will evaluate the drainage at the vehicle and equipment wash facility for possible improvement. Water from the Public Works vehicle and equipment wash facility drains into a two catch basins that flow to the sanitary system. Currently, most City vehicles are washed at the Public Works facility, but there is no policy that mandates all vehicles are washed there. The City will develop a policy requiring all City departments, excluding Fire, to wash City vehicles at the Public Works facility. The Fire Department normally washes the Fire Trucks at the stations, and the City will evaluate the need to install catch basins at each fire station to prevent the automotive wash off from entering the storm sewer system.

No wash water should enter a stormwater drainage system. Vehicle and equipment wash facilities should recycle the wash water in a contained system or route the wash water to a sanitary sewer (a general permit may be issued by the TCEQ for direct discharge of wash water following pretreatment). Wash areas should be covered to minimize the amount of stormwater that enters the recycle or sanitary sewer system. If such a wash facility is not available or feasible, consider contracting vehicle and equipment cleaning offsite. Use only biodegradable and phosphate-free detergents.

Catch basins should be cleaned on a regular basis so as to maintain their function, which is to remove solids washed off the street during rainfall events. If not maintained, these materials can be discharged to local waterways. Sugar Land will review the existing catch basin maintenance schedule and determine if improvements can be made.

**Measurable Goals**

- Evaluate the drainage at the vehicle and equipment wash facility and make a recommendation.
- Implement recommendation.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – To be determined

**Implementation Schedule**
Evaluate the drainage at the vehicle and equipment wash facility and make a recommendation in Permit Year 2. The recommendation, if any, will be implemented in Permit Year 3.

## 7.8 SPILL PREVENTION AND RESPONSE

**Description**

Sugar Land will develop procedures and acquire equipment for prevention and timely response to spills from municipal operations. Sugar Land will provide training to applicable employees in spill response procedures and will provide spill response kits in convenient locations at the facility. In addition, the City will consider and address how spill response is handled both at municipal facilities and in the field to prevent spilled materials from entering the drainage system. A proper spill response procedure could save the costs of cleaning up material contaminated by spills.

**Measurable Goals**

- Provide spill response kits and training to applicable employees.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies
  - Spill Kits
  - Dry absorbent
  - Training

**Implementation Schedule**
Provide spill response kits and training to applicable employees in Permit Year 2.

## 7.9 FACILITY INSPECTION PROGRAM

**Description**
Sugar Land will formalize municipal facility inspection procedures that potentially affect stormwater quality. These inspections will be conducted as part of the annual self-audit for City facilities. As a result of these inspections, the Auditor will develop stormwater minimization plans for City facilities as deemed necessary. Such inspections might include:

- Inspect and maintain stormwater treatment processes
- Routinely inspect vehicles and equipment for leaks
- Inspect and maintain sewer and drainage system.

Inspections facilitate early response to potential problems, usually at a lower cost. City staff will require more time to inspect facilities for pollutant sources that might impact stormwater quality. City staff will develop a list of items to be inspected, inspection procedures, inspection checklists, assignment of responsibility, and a procedure for documentation of response.

**Measurable Goals**

- Develop and implement inspection procedures.
- Develop inspection checklists.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**
Develop a list of facilities to be inspected in Permit Year 2. Develop or modify inspection procedures and inspection checklists in Permit Year 2. Implement inspection program in Permit Year 3.

## 7.10 EROSION/SEDIMENT CONTROL

**Description**
Municipalities need to adhere to the same construction site soil erosion and sediment controls required of private developments. Communities that are engaged in construction projects on community owned lands should develop comprehensive soil erosion and sediment controls and assure that they are fully implemented.

**Measurable Goals**

- Develop comprehensive soil erosion and sediment controls for construction sites greater than or equal to one acre on community owned lands.
- Monitor municipal construction projects to ensure that soil erosion and sediment controls are fully implemented.

**Costs**

- Labor – To be determined
- Equipment/Supplies – To be determined

**Implementation Schedule**
Develop comprehensive soil erosion and sediment controls for municipal construction projects in Permit Year 3. Throughout permit term, monitor municipal construction projects to ensure that soil erosion and sediment controls are fully implemented.

## 7.11 LANDSCAPING

**Description**
Contract and City employees engaged in landscaping activities should be trained in proper use of landscaping chemicals and in proper green waste disposal. In addition, workers should be trained to pick up any litter before mowing so that the trash doesn't get shredded and washed into the storm drain. The goal of landscaper education is to reduce chemical and green waste runoff to natural watercourses. This is accomplished by minimizing the use of herbicides, fertilizers, and insecticides to no more than the

recommended levels and by properly disposing of green waste resulting from mowing, tree trimming, weed eating, and edging.

The City currently works with lawn maintenance contractors to minimize pollutants that flow to the storm drains. The Parks & Recreation Department coordinates with lawn maintenance workers to ensure that no fertilizer or pesticides are put out on the day of a storm. However, this management practice is not written into City lawn maintenance contracts. Sugar Land will develop contractual agreements that will require lawn maintenance contractors to follow stormwater quality BMPs. Sugar Land will also encourage contractors to recycle green waste when possible.

Sugar Land will also develop and implement a chemical application training program for all employees who handle or apply landscaping chemicals, including contracted employees. All employees should undergo training before they are allowed to apply any landscaping materials. As part of this program, the City will maintain a record of chemicals used, where they were used, and how they were applied including application rates.

**Measurable Goals**

- Develop or acquire training materials on the proper use of landscaping chemicals and the proper disposal of yard waste.
- Implement employee training program for contract and City employees on the proper use of landscaping chemicals and the proper disposal of yard waste.
- Change contract verbiage for outsourced landscaping activities to require contractors to follow program recommendations.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – Training materials

**Implementation Schedule**

Develop or acquire training materials in Permit Year 3. Implement employee training program in Permit Year 3. Change contract verbiage for outsourced landscaping activities in Permit Year 3.

## 7.12 OPEN SPACE MANAGEMENT

**Description**

The objective of this BMP is to reduce pollution and its effects by limiting maintenance operations near natural watercourses by leaving a buffer area that is natural and uncut. It also involves the encouragement of tree growth to enhance natural watercourse health.

Sugar Land will evaluate the need to develop a policy to protect and preserve open space buffer areas and to establish no-mow zones to allow trees and shrubs to reclaim disturbed stream banks.

**Measurable Goals**

- Evaluate the need to develop a policy to protect and preserve open space buffer areas and to establish no-mow zones.
- Implement policy, if deemed necessary.

**Costs**

- Labor – Existing City staff
- Equipment/Supplies – N/A

**Implementation Schedule**

In Permit Year 2, evaluate the need to develop a policy to protect and preserve open space buffer areas and to establish no-mow zones. Implement policy in Permit Year 3, if deemed necessary.